Claims

WHAT IS CLAIMED IS:

1. A computer program product encoding a computer program for executing on a computer system a computer process for simulating performance of a software system including one or more resources, the computer process comprising:

generating one or more workload definition sequences defining the software system, each
5 workload definition sequence including a plurality of workload request nodes, the workload definition sequence including at least two of the workload request nodes having a sequential relationship relative to different simulation intervals;

receiving the workload definition sequence into an evaluation engine; and

evaluating the one or more workload definition sequences to simulate the performance of
10 the software system.

2. The computer program product of claim 1 wherein each request node is defined independently of a specific hardware model instance.

3. The computer program product of claim 1 wherein each workload request node defines a transaction associated with a resource in the software system.

4. The computer program product of claim 1 wherein each workload request node represents one or more component events associated with a resource in the software system,

5. The computer program product of claim 1 wherein the one or more workload sequences are generated prior to the receiving and evaluating operations and substantially define all workload request nodes for simulating performance of the software system.

6. The computer program product of claim 1 wherein each workload request node defines a device option characterizing constraints on how the workload request node may be assigned to a resource in the software system.

7. The computer program product of claim 1 wherein at least one workload sequence includes a fork node defining a split of one workload sequence branch into a plurality of workload sequence branches.

8. The computer program product of claim 1 wherein at least one workload sequence includes a join node defining a combination of a plurality of workload sequence branches into a single workload sequence branch.

9. The computer program product of claim 1 wherein the computer process further comprises:

receiving at least one of a monitoring trace, statistical data, and a workload specification to generate the one or more workload definition sequences.

10. The computer program product of claim 1 wherein the operation of receiving at least one of a monitoring trace, statistical data, and a workload specification comprises:

receiving the monitoring trace defining a sequence of software system requests relating to an application request associated with the application.

11. The computer program product of claim 1 wherein the operation of receiving at least one of a monitoring trace, statistical data, and a workload specification comprises:

receiving the statistical data defining a statistical distribution of one or more application requests associated with the application.

12. The computer program product of claim 1 wherein the operation of receiving at least one of a monitoring trace, statistical data, and a workload specification comprises:

receiving the workload specification defining a set of resource request descriptions associated with the software system.

13. The computer program product of claim 1 wherein each workload definition sequence comprises a start node associated with a start time, and the simulating operation comprises:

activating at least one of the workload definition sequences, if the start time associated with the start node of the workload definition sequence satisfies the simulation interval value.

14. The computer program product of claim 1 wherein the simulation operation comprises:

translating at least one of the workload request nodes into one or more component events recorded in an event queue.

15. The computer program product of claim 14 wherein the evaluating operation comprises:

scheduling each component event with an instance of a hardware model associated with a resource in the software system.

16. The computer program product of claim 14 wherein the evaluating operation comprises:

scheduling, based on a scheduling policy, each component event with an instance of a hardware model associated with a resource in the software system.

17. The computer program product of claim 14 where the evaluating operation further comprises:

receiving one of the component events from the event queue;

identifying a resource associated with the component event;

scheduling the component event with an instance of a hardware model associated with the resource in the software system; and

simulating the component event using the instance of the hardware model.

18. A performance simulation system for simulating performance of a software system, the performance simulation system comprising:

a workload generator generating one or more workload definition sequences defining the software system, each workload definition sequence including a plurality of workload request

5   nodes, the workload definition sequence including at least two of the workload request nodes having a sequential relationship relative to different simulation intervals; and

an evaluation engine receiving the one or more workload simulation sequences and evaluating the one or more workload definition sequences to simulate the performance of the software system.

19. The performance simulation system of claim 18 wherein each workload request node defines a transaction associated with a resource in the software system.

20. The performance simulation system of claim 18 wherein each workload request node represents one or more component events associated with a resource in the software system.

21. The performance simulation system of claim 18 wherein each workload request node defines a device option characterizing constraints on how the workload request node may be assigned to a resource in the software system.

22. The performance simulation system of claim 18 wherein at least one workload sequence includes a fork node defining a split of one workload sequence branch into a plurality of workload sequence branches.

23. The performance simulation system of claim 18 wherein at least one workload sequence includes a join node defining a combination of a plurality of workload sequence branches into a single workload sequence branch.

24. The performance simulation system of claim 18 wherein each workload definition sequence comprises a start node associated with a start time, and the evaluation engine comprises:

a simulation clock incrementing a simulation interval value; and

an activator activating one of the workload definition sequences, if the start time associated with the start node of the workload definition sequence satisfies the simulation interval value.

25. The performance simulation system of claim 18 wherein the evaluation engine comprises a sequence processor translating at least one of the workload request nodes into one or more component events.

26. The performance simulation system of claim 25 wherein the evaluation engine comprises:

an event queue receiving the component events from the sequence processor.

27. The performance simulation system of claim 25 wherein the evaluation engine further comprises a scheduler module assigning each component event to an instance of a hardware model representing a resource in the software system.

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28. The performance simulation system of claim 27 wherein the scheduler module has access to a scheduling policy governing an assignment of a component event to an instance of a hardware model by the scheduler module.

29. The performance simulation system of claim 18 wherein the evaluation engine comprises a simulator determining a duration of a component event assigning to an instance of a hardware model.

30. A method of simulating performance of a software system including one or more resources, the method comprising:

generating one or more workload definition sequences defining the software system, each workload definition sequence including a plurality of workload request nodes, the workload definition sequence including at least two of the workload request nodes having a sequential relationship relative to different simulation intervals;

receiving the workload definition sequence into an evaluation engine; and

evaluating the one or more workload definition sequences to simulate the performance of the software system.

31. The method of claim 30 wherein each request node is defined independently of a specific hardware model instance.

32. The method of claim 30 wherein each workload request node defines a transaction associated with a resource in the software system.

33. The method of claim 30 wherein each workload request node represents one or more component events associated with a resource in the software system,

34. The method of claim 30 wherein the one or more workload sequences are generated prior to the receiving and evaluating operations and substantially define all workload request nodes for simulating performance of the software system.

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35. The method of claim 30 wherein each workload definition sequence comprises a start node associated with a start time, and the simulating operation comprises:

activating at least one of the workload definition sequences, if the start time associated with the start node of the workload definition sequence satisfies the simulation interval value.

36. The method of claim 30 wherein the simulation operation comprises:

translating at least one of the workload request nodes into one or more component events recorded in an event queue.

37. The method of claim 36 wherein the evaluating operation comprises:

scheduling each component event with an instance of a hardware model associated with a resource in the software system.

38. The method of claim 36 wherein the evaluating operation comprises:

scheduling, based on a scheduling policy, each component event with an instance of a hardware model associated with a resource in the software system.

39. The method of claim 36 where the evaluating operation further comprises:

receiving one of the component events from the event queue;

identifying a resource associated with the component event;

scheduling the component event with an instance of a hardware model associated with the resource in the software system; and

simulating the component event using the instance of the hardware model.